lactating ewes on milk performance and fatty acid profile

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Introduction

Enhancing healthy fatty acids (FAs) in ewe milk fat is an important objective in terms of improving the nutritional value of these foods for the consumer. Several nutritional strategies have been studied to improve the FA profile of milk, mostly by including in the ewe diet unsaturated fats. However, unsaturated fats generally cause a shift in the rumen BH pathways with increases in ruminal outflow of specific *trans*-FAs (e.g. *trans* 10 18:1), which leads to a reduction in milk fat synthesis in the mammary gland. Feeding animals with fatty acids (FAs) in the form of calcium soaps from different oils could prevent, even if only partially, biohidrogenation of PUFA in the rumen and reduce the proportion of SFAs and trans-FAs in the milk.

The **objetive** of this study was to evaluate the effects of different calcium soaps of FAs (CSFAs) of olive oil and fish oil in the diet of Churra ewes during the first month of lactation on milk performance and fatty acid profile.

Material and methods

36 Churra ewes
60.9 ± 1.36 Kg

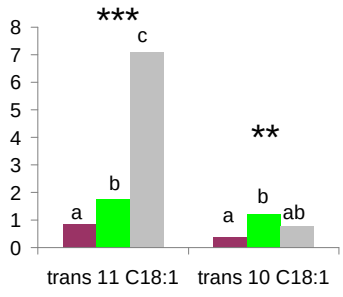
12 ewes per treatment
3 dietary treatments

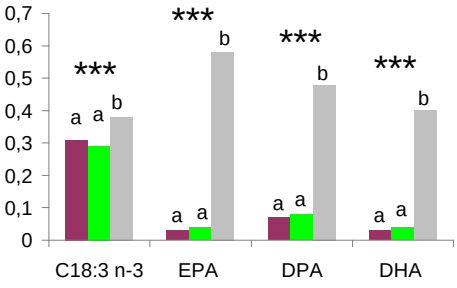
	Calcium soap of palm oil	Calcium soap of olive oil	Calcium soap of fish oil
	CONTROL	OLI	FO
Dehydrated alfalfa	39.38	39.38	39.38
Soybean meal	13.77	13.77	13.77
Corn grain	11.83	11.83	11.83
Oat grain	10.38	10.38	10.38
Barley grain	7.86	7.86	7.86
Beet pulp	7.86	7.86	7.86
Molasses	4.95	4.95	4.95
Magnapac[1]	3	0	0
Olifat[2]	0	3	0
Strata-g[3]	0	0	3
Vitamin-mineral premix	1.00	1.00	1.00

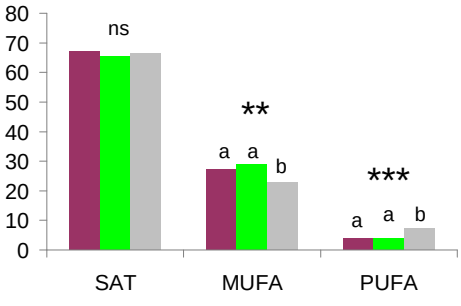
- Individual **milk yield and composition** was recorded weekly during the first month of lactation.
- **Fat, protein** and **total solids content of milk** were analysed using a MilkoScan-400 analyser.
- **Milk fatty acid composition** of individual samples from weeks 2 and 4 were analysed by gas chromatography according to Luna et al. (2008).
- **Data** were evaluated by the MIXED procedure of SAS.

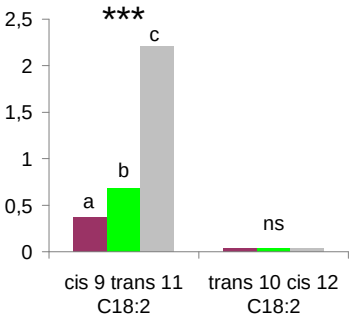
Results

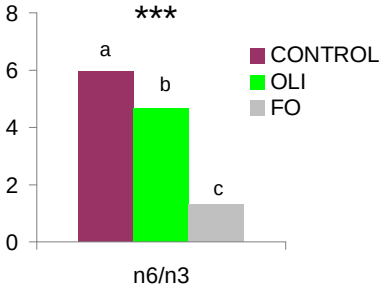
	CONTROL	OLI	FO	SED	Diet
Milk yield (g/day)	1686	1908	1597	323,9	ns
Fat (%)	5.42[a]	4.48[b]	3.53[c]	0,649	***
Protein (%)	4.42	4.56	4.64	0,185	ns
Total solids (%)	15.3[a]	14.86[a]	14.11[ab]	0,323	***











ns P > 0.05, * P < 0.05; ** P < 0.01;*** P < 0.001. [a, b, c] means with different superscripts differ significantly

Conclusions

The supplementation of ewe diets during the first month of lactation with different CSFAs did modify the FA profile of milk fat. CSFAs of fish oil produced more important changes than the supplementation of the ewe diet with CSFAs of olive oil. Although in the assayed conditions, the addition of CSFAs of fish oil decreased the milk fat content, it also significantly increased healthy FAs, such as n-3 PUFAs and rumenic acid (*cis 9 trans* 11 C18.2). Moreover, this took place without a simultaneous increase in either SFAs or *trans*-FAs such as *trans 10* 18:1.

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